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# CONTROL OF CHERRY LEAF-SPOT

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THE LEAF-SPOT OF THE CHERRY seriously injures both sweet and sour varieties of that fruit in many sections of the eastern half of the United States.

It is caused by a fungus which lives through the winter on the fallen leaves and infects the new leaves in the spring.

The best control of this disease is obtained by spraying with a diluted lime-sulphur solution or with Bordeaux mixture (1) as soon as the petals fall, (2) about three weeks later, and (3) directly after the fruit is picked.

Contribution from the Bureau of Plant Industry
WM. A. TAYLOR, Chief
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# CONTROL OF CHERRY LEAF-SPOT.

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## DESTRUCTIVENESS OF CHERRY LEAF-SPOT.

The disease most seriously affecting the foliage of the cherry in the eastern United States is commonly known as leaf-spot or shot-

FIG. 1.—An unsprayed Montmorency cherry tree. Defoliation caused by the leaf-spot prevented the fruit of this tree from properly maturing. (Photographed at Benton Harbor, Mich., July 11, 1916.)

hole. It attacks both sweet and sour varieties, though the latter are usually more susceptible, all of the common varieties, such as English Morello, Montmorency, and Early Richmond, often being injured severely.

In mild cases only a few leaves may be injured, but frequently infections are so numerous that the tree is defoliated by midsummer. In such cases growth is interfered with and the tree becomes stunted and may be killed if defoliated through successive seasons or if otherwise in poor condition. A tree severely attacked in the early spring usually fails to mature its fruit, which may continue to hang on the tree in a semimature condition throughout the season. (See fig. 1.)

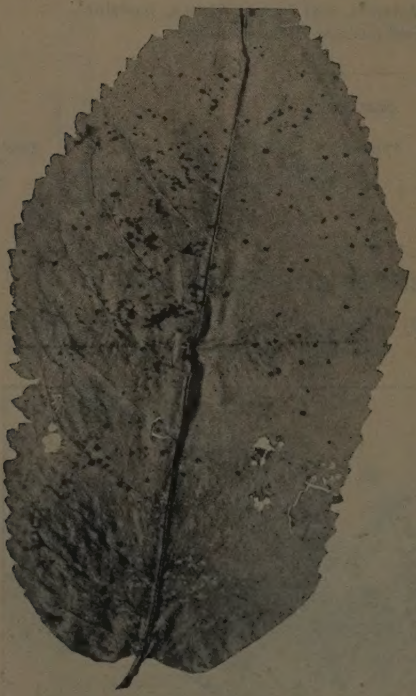

FIG. 2.—Leaf-spot on the sweet cherry.

Cherry leaf-spot occurs quite generally over the eastern half of the United States and has been reported as very destructive in Illinois, Iowa, Nebraska, Michigan, Connecticut, New York, and New Jersey.

## DESCRIPTION OF THE LEAF-SPOT.

Upon the affected leaves the disease first appears as small purplish spots, which later turn brown (figs. 2 and 3). These spots are usually circular, but several may coalesce to form a more or less irregular area (fig. 3). After the spots have ceased to increase in size, the formation of corky tissue between the relatively healthy adjacent tissue and the diseased spot may cause the affected areas to drop out, giving to the leaf the so-called "shot-hole" effect (fig. 4). Badly infected leaves turn yellow and fall. In severe cases the tree may be defoliated very early in the summer, since infections may occur throughout the growing period. Infections may occur also upon the stems of the fruits, but as these are usually found only in the case of fruits which, owing to defoliation caused by the disease, have continued to hang on the tree in an immature state long after their season, they are ordinarily of little importance.

## CAUSE OF THE DISEASE.

The fungus[1] which is the causal organism involved in the production of cherry leaf-spot passes the winter in the fallen leaves, whence it infects the new leaves of the following season by means of spores (ascospores) which when mature are literally shot up into the tree. "Summer" spores produced by the fungus in these newly infected leaves are carried by rain and wind to other leaves, which in time become infected. Thus infections become increasingly abundant as the season advances.

FIG. 3.—Leaf-spot on the sour cherry.

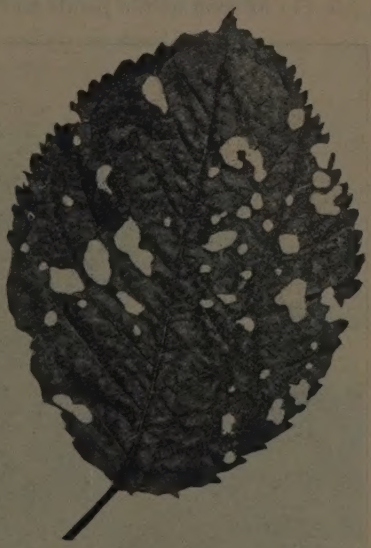

FIG. 4.—Leaf-spot on the sweet cherry, showing the "shot-hole" effect which may appear in the later stages of the disease.

## CONTROL MEASURES.

During the seasons of 1916 and 1917 control experiments were carried on in Michigan on the sour varieties. Various sulphur and copper preparations, both commercial and homemade, were used, but of all the spray materials used lime-sulphur solution and Bordeaux mixture were the only ones which gave satisfactory results. Trees sprayed with self-boiled lime-sulphur were almost as badly diseased as the unsprayed trees. In both seasons three applications made (1) as soon as the petals had fallen, (2) about three weeks later, and (3) directly after the fruit had been picked gave excellent control when Bordeaux mixture composed of 3 pounds of bluestone, 4 pounds of lime, and 50 gallons of water or when lime-

[1] *Coccomyces hiemalis* Higgins. Before the discovery of its ascogenous stage it was called *Cylindrosporium padi* Karst.

sulphur solution diluted at the rate of 1½ gallons to 50 gallons of water were used on sour varieties. The omission of any one of the three applications resulted in serious foliage loss. For the control of insect pests, 2 pounds of arsenate of lead paste were added to each 50 gallons of spray in the first two applications.

Lime-sulphur solution diluted at the rate of 1¼ gallons to 50 gallons of water was not strong enough to control severe cases in three applications. At this dilution, however, four applications made (1) as soon as the petals had fallen, (2) two weeks later, (3)

FIG. 5.—A Montmorency cherry tree which had received three applications of 3–4–50 Bordeaux mixture. The abundant foliage here is in striking contrast to the almost complete defoliation shown in figure 6. The trees sprayed three times with lime-sulphur solution (1¼ to 50) were also in excellent condition. (Photographed at Hart, Mich., August 30, 1917.)

four weeks after the petals had fallen, and (4) directly after the fruit had been picked brought about excellent control. In the case of trees dusted with finely ground sulphur, there was much less defoliation than in the case of the untreated ones, but the leaf-spot was not adequately controlled. During both years the disease was very severe and caused heavy defoliation in unsprayed orchards. A comparison of figures 5 and 6 will give some idea of the value of the spray in preventing defoliation by the leaf-spot.

Similar experiments were carried on for controlling the disease on the sweet cherry. Bordeaux mixture and lime-sulphur solution when used at the usual strength injured the foliage severely, but lime-sulphur solution at the rate of 1 gallon to 50 gallons of water caused very little injury and controlled the disease very well. The disease on sweet cherries, therefore, proved to be much easier to control than that on sour varieties.

## CONCLUSIONS AND RECOMMENDATIONS.

For the control of leaf-spot, sour cherries should be sprayed with lime-sulphur solution diluted at the rate of 1½ gallons to 50 gallons of

FIG. 6.—An unsprayed Montmorency cherry tree in the same orchard as the sprayed tree shown in figure 5. (Photographed at Hart, Mich., August 30, 1917.)

water or with Bordeaux mixture containing 3 pounds of bluestone (copper sulphate) and 4 pounds of lime to each 50 gallons of water—

(1) As soon as the petals have fallen.
(2) About three weeks later.
(3) Directly after the fruit is picked.

Arsenate of lead at the rate of 1 pound of powder or 2 pounds of paste to 50 gallons of spray may be added for the control of insect pests.

Sweet cherries should receive the same treatment as the sour ones, except that lime-sulphur solution diluted at the rate of 1 gallon to

50 gallons of water should be the fungicide used. Bordeaux mixture should never be used on sweet cherries, because of the risk of severe injury.

Often, especially in the South, the disease may be controlled by spraying three weeks after the petals have fallen and directly after the fruit has been picked, or sometimes only after the fruit has been picked, but the omission of any one of these three applications is always attended with risk.

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